The plants are remarkably peculiar in form and remarkably simple in structure, and probably represent degraded remnants of a more complex ancestry. The environment which they meet because of the peculiar habitat must have had a powerful influence in reducing them to their present rather stereotyped morphology. For while it has now been shown that there are considerable variations in species, and a goodly number of both species and genera are represented, one is struck by the constantly recurring facies running through many of the different genera.

The members of the family are attached to the legs or bodies of insects, usually those inhabiting damp or wet localities. An individual consists of a simple stalk for attachment, which bears a simple elongate perithecium as a lateral appendage, or is terminated by the same, while the antheridia may terminate the plant, or occur as a simple or tufted lateral growth. By studies of the development of a large number of species, and by the examination of a large series of forms, the limits of specific variation have been quite well determined, so that a fairly good basis has been established for the recognition of species and genera, and the systematic arrangement of the known forms can be presented with a good deal of confidence.

The discovery by Karsten, as early as 1869, of a trichogyne on the perethicium, and the fusion with it of bodies resembling the sperm cells of the Rhodophyceæ, indicating sexuality in these plants, has been fully confirmed by Dr. Thaxter's studies, and we need now only the knowledge of the actual nuclear fusions in the different steps of fertilization to show how the ascus originates as a result. The female organ shows a striking resemblance to the trichophoric apparatus in certain of these algæ, as suggested first by Karsten. These investigations serve to confirm this view, and the conclusion is drawn that this family of ascomycetes has originated from the Florideæ, and may possibly have been the point of origin of the ascomycetous fungi, Twenty-eight genera and one hundred and fifty-two species are described and illustrated; the larger majority of these are named by the author.

GEO. F. ATKINSON.

A Report on the Work and Expenditures of the Agricultural Experiment Stations for the Year Ended June 30, 1897. By A. C. TRUE. U. S. Department of Agriculture, Office of Experiment Stations, Bulletin 50. 1898. Pp. 97.

This valuable document should be perused by every friend of science in America. Dr. True, the Director of the Office of Experiment Stations, has not only followed the work of the stations from his office in Washington for many years, but has himself visited and critically investigated every one of them. Unlike many critics of station work, he has been slow in arriving at conclusions; erring, if at all, on the side of extreme caution rather than of haste. His natural bias of mind seems to be conservative, and added to this is his evident sense of the responsibility of his position; so that we may be sure his criticisms and suggestions for reform are only those which he has felt forced to make in the face of overwhelming evidence.

Yet we read these words (pp. 6–7): "In one respect the past year has been a period of unusual discouragement to those who have the best interests of the experiment stations at heart. From changes in the constitution of the governing boards, due to legislative action, changes in the Governors having power of appointment or removal of members of these boards, and other causes, the Directors of the stations in ten States and Territories have been changed since the last [annual] report was prepared. In several cases the Directors removed had had long and successful experience in the management of the stations and had made their work increasingly useful. In these and other cases the removal of the Director was accompanied by a further reorganization of the station staff. * * * The numerous changes in the station staffs recently made are calculated to shake faith in the wisdom of committing the stations so fully to the control of the local boards."

Taking the stations separately, we find:

Idaho.—"The station has fallen behind in its publications; its finances have been in an unsatisfactory condition, and its operations have been very largely of a superficial character."

Kansas.—"Out of fourteen persons constitut-

ing the station staff, whose names were published in our official organization list, February, 1897, six are now on the staff, three of the officers retained being assistants. Our examination of the expenditures, publications and work of the station has not revealed any good and sufficient reasons for this radical reorganization."

North Carolina.—"The station has been weakened by the loss [*i. e.*, dismissal] of successful and experienced officers and by the uncertainties attending a change of management and a somewhat dubious financial outlook."

North Dakota.—"The recent dismissal of the experienced veterinarian and the appointment of an untried man in his place has awakened fears that the influences which hitherto have hindered the progress of the station are still at work."

Oregon.—"The affairs of the Oregon Station during the past year have not been in a satisfactory condition. * * * At the close of the fiscal year the President and Director was removed after one year's service. The Horticulturist and Assistant Botanist were also removed."

West Virginia.—"After some nine years of faithful service, during which period he had managed the station successfully under unusual difficulties * * * the Director was dismissed by the board at its first meeting, though no charges affecting his personal or professional standing were preferred."

And so forth. Of course, it must not be imagined that all the stations are subject to these evils, nor would Dr. True admit for a moment that the stations as a whole are a failure. On the contrary, the splendid work done by many of these institutions, such as those of Wisconsin, Ohio, New Jersey, Minnesota, Massachusetts, Cornell University, etc., cannot be too highly praised or too warmly supported. These wisely-governed stations have demonstrated beyond question that the money spent under the Hatch Act may be made to yield handsome profits to the nation; that the expenditure of national funds for scientific research is one of the best means of preserving and increasing the wealth and reputation of the United States. We are indebted for very much to the laboratories of Europe; but the time has come when one can rarely open a recent European work on any branch of agricultural science without finding numerous and flattering references to the U. S. Department of Agriculture and Experiment Stations. If this is so, what are the people of the United States about that they permit such golden opportunities in many cases to be lost—muddled away by men of whom it is charitable to suggest that they are merely incompetent? What are the scientific men of this country thinking of, that they witness unmoved the desecration of the very temples of science? I do not suggest or know of anything worse than is plainly to be read in this report now before us, the work of a cautious scientific man, who has had every opportunity for ascertaining the actual facts. It is not necessary to go behind Dr. True's deliberate statement to find grounds for an energetic movement in support of genuine scientific work and workers in the experiment stations.

To merely contemplate the virtual loss of so many thousand dollars through bad management here and there would give quite an erroneous impression. We can afford to lose the whole Hatch fund every year, if it must be, without serious detriment to the nation; *but we cannot afford to lose the fruits of scientific research, which are worth an incalculable sum.* If one station has produced good results, so can all, under proper control. There is probably not a station in which much good work has not been in progress at one time or another; but in many instances the natural fructification of a research has been prevented, and in consequence past efforts rendered unavailing.

The duty of scientific men in this matter is clear. They should, in the first place, seek to become familiar with the good work of the stations, so that they can appreciate what is being done, and realize how much more might be done. They should then make it their business to protest vigorously against every effort to interfere with competent workers, or interrupt the continuity of their work; while at the same time educating the people to a sense of the possibilities inherent in experimental work. If every man of science in this country would thus

work in the interests of his muse, instead of merely for his own selfish ends, the public would not be slow to appreciate scientific work more nearly in accordance with its merits.

T. D. A. COCKERELL.

Il Codice Atlantico di Leonardo da Vinci nella biblioteca ambrosiana di Milano. Reprodotto e pubblicato dalla Regia Accademia dei Lincei sotto gli auspice e col sussido del Re e del Governo. Milano. ULRICO HOEPLI, Editore Librajo della Real Casa e della R. Accademia dei Lincei. New York, G. E. Stechert. 1894–8. 35 parts; 800 pages; 1750 drawings and illustrations; folio. $240.

This magnificent reproduction of the extraordinary works of one of the most wonderful men of genius known to history is a work for which the world has long waited. It is issued in parts to subscribers, and none are furnished to the trade or furnished as complimentary copies. Each of its thirty-five parts contains 40 heliotype plates, reproducing the drawings and sketches of the great author, with double transcription of the text, and with notes. It is printed upon hand-made paper, 38 cm. (15 in.) by 50 cm. (20 in.) in dimensions; and but 280 copies, it is stated, will be issued. The first 20 copies are supplied to the earliest subscribers, in order of date, at a discount of 20 per cent. Inspection is permitted of the first part before subscribing.

The work has been performed under the direction of the Italian Ministry of Public Instruction, and with direct supervision of the Royal Academy, and the transcription was made by Dr. John Piumati—already distinguished both for his learning and for his success in earlier and somewhat similar work—assisted by Lucas Beltrami, well known in connection with his work on the Vincian Codex of the Trivulzian Library. The work is intended to give as complete a reproduction as the existing remains permit of the collection of manuscripts of Leonardo, now almost four centuries old, which, since the death of Menzi, a half-century after their completion, have been dispersed.

Pompeo Leoni gathered a large proportion of them together, somewhat later (1587), and produced the 'Codex Atlanticus' of that time. Cardinal Frederic Borromeo ordered its transcription in 1626, and his Ambrosian Library became its possessor in 1637, meantime an offer of a thousand doubloons from Charles I. of England having been refused. During the last century Anthony David made a study of its collections in mechanics, and Balthasar Oltroccio, Governor of Ambrosian Library, made it the basis of a Life of Leonardo, later published by Amoretti. The Codex itself was captured by the French in 1796, and taken to Paris for the National Library, where Venturi found it and made it the source of his writings upon physics and mathematics, largely.

Libri, Omodeo, Angellucci and others studied it in its old home, but the publication of the whole collection has only now been undertaken. The commencement of the enterprise here illustrated was actually made with the issue of the 'Saggio' at the time of the inauguration of the monument to Leonardo, at Milan, in 1872; its twenty-four plates giving a foretaste of what was coming, so interesting and absorbing to collectors and admirers of the great soldier, poet, engineer, artist, and man of science, as to compel immediate assurance of the ultimate completion of the work.

This splendid reproduction will throw new light upon the character and achievements of the man who has been mainly portrayed by his biographers as a sort of Admirable Crichton with a genius primarily artistic, and who have obtained their ideas from such biographies, rather than from a source giving a true account of his life and his work in all its various fields. Even a cyclopedia like Johnson's, generally regarded as having a scientific rather than a literary or artistic character, gives prominence to his accomplishments as artist, says little of his achievements as soldier, his talents as engineer, or his learning in science and in literature. His 'Last Supper' is given deserved attention; a catalogue of his paintings is presented, and a good bibliographical list is submitted; but its author says: "It is impossible, in the space at command, to give an account of Leonardo's scientific labors;" and none is given, and but little is suggested, to indicate to the reader the fact that he was a great military engineer, a